Wi-Fi Module

User Manual

GS2011MIES

An IEEE 802.11b/g/n Low-Power Wireless System-On-Chip module

This document describes a simple method for characterizing GS2011MIES WLAN module based RF parameters, such as transmitted spectra and receiver sensitivity. It will be described step by step below that how to control and setup.

Step 1 : Extract to CDM20814_WHQL_Certified.zip, it is a USB to UART driver, then setup it.

Step 2 : Setup *teraterm_utf8-4.58.exe* program, this program can help to send command to module.

Step 3 : Double click UTF-8 execute file as shown below, it will occur after completing step2 install.

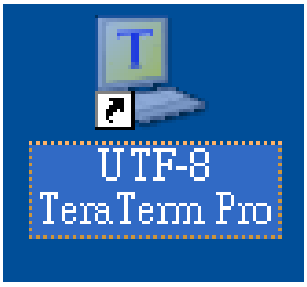


Figure 1

Step 4 : When implement UTF-8, selecting Serial port correctly.

Figure 2

Step 5 : After entering UTF-8, send command at. If connection is successful, it will reply ok.

Step 6 : Now any legal command can be keyed in and if UTF-8 reply ok, the command is implemented successful like below figure.

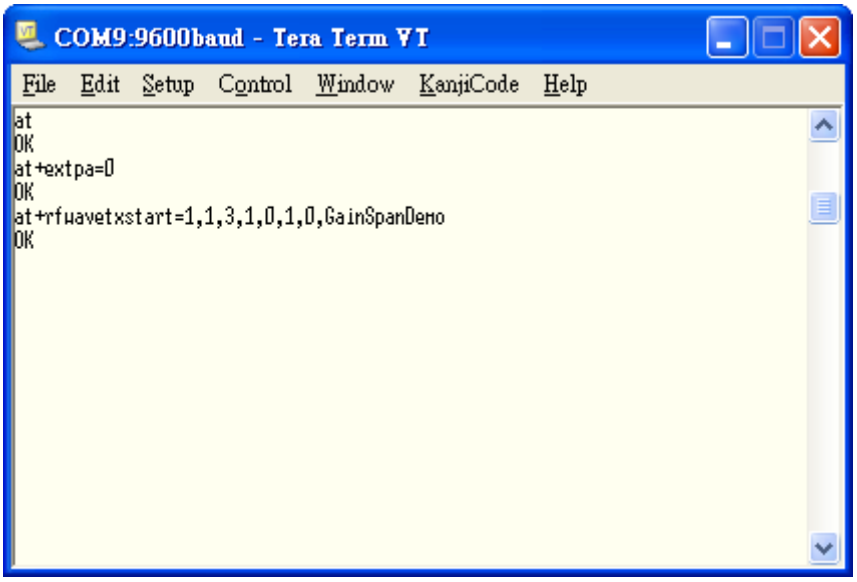


Figure 3

802.11b, Transmitter command:

Transmitted Tx at 11Mbps		
Command	Action	
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,11,0,0,0,0,1,1,0,0,1,3,1	Continuous Tx Channel 1, 11Mbps	
at+wtx100test=6,0,11,0,0,0,0,1,1,0,0,1,3,1	Continuous Tx Channel 6, 11Mbps	
at+wtx100test=11,0,11,0,0,0,0,1,1,0,0,1,3,1	Continuous Tx Channel 11, 11Mbps	
At+reset	Transmitter off	
Transmitted Tx at 5.5Mbps		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,14,0,0,0,0,1,1,0,0,1,2,1	Continuous Tx Channel 1, 5.5Mbps	
at+wtx100test=6,0,14,0,0,0,0,1,1,0,0,1,2,1	Continuous Tx Channel 6, 5.5Mbps	
at+wtx100test=11,0,14,0,0,0,0,1,1,0,0,1,2,1	Continuous Tx Channel 11, 5.5Mbps	
At+reset	Transmitter off	
Transmitted Tx at 2Mbps		

at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,9,0,0,0,0,1,1,0,0,1,1,1	Continuous Tx Channel 1, 2Mbps	
at+wtx100test=6,0,9,0,0,0,0,1,1,0,0,1,1,1	Continuous Tx Channel 6, 2Mbps	
at+wtx100test=11,0,9,0,0,0,0,1,1,0,0,1,1,1	Continuous Tx Channel 11, 2Mbps	
At+reset	Transmitter off	
Transmitted Tx at 1Mbps		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,18,0,0,0,0,1,1,0,0,1,0,1	Continuous Tx Channel 1, 1Mbps	
at+wtx100test=6,0,18,0,0,0,0,1,1,0,0,1,0,1	Continuous Tx Channel 6, 1Mbps	
at+wtx100test=11,0,18,0,0,0,0,1,1,0,0,1,0,1	Continuous Tx Channel 11, 1Mbps	
At+reset	Transmitter off	

802.11g, Transmitter command:

Transmitted Tx at 54Mbps		
Command	Action	
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,19,0,0,0,0,1,0,0,0,1,4,0	Continuous Tx Channel 1, 54Mbps	
at+wtx100test=6,0,19,0,0,0,0,1,0,0,0,1,4,0	Continuous Tx Channel 6, 54Mbps	
at+wtx100test=11,0,19,0,0,0,0,1,0,0,0,1,4,0	Continuous Tx Channel 11, 54Mbps	
At+reset	Transmitter off	
Transmitted Tx at 48Mbps		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,24,0,0,0,0,1,0,0,0,1,0,0	Continuous Tx Channel 1, 48Mbps	
at+wtx100test=6,0,24,0,0,0,0,1,0,0,0,1,0,0	Continuous Tx Channel 6, 48Mbps	
at+wtx100test=11,0,24,0,0,0,0,1,0,0,0,1,0,0	Continuous Tx Channel 11, 48Mbps	
At+reset	Transmitter off	
Transmitted Tx at 36Mbps		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,25,0,0,0,0,1,0,0,0,1,5,0	Continuous Tx Channel 1, 36Mbps	
at+wtx100test=6,0,25,0,0,0,0,1,0,0,0,1,5,0	Continuous Tx Channel 6, 36Mbps	
at+wtx100test=11,0,25,0,0,0,0,1,0,0,0,1,5,0	Continuous Tx Channel 11, 36Mbps	
At+reset	Transmitter off	
Transmitted Tx at 24Mbps		
at+wrfteststart	Start up internal Power Amplifier	

at+wtx100test=1,0,26,0,0,0,0,1,0,0,0,1,1,0	Continuous Tx Channel 1, 24Mbps	
at+wtx100test=6,0,26,0,0,0,0,1,0,0,0,1,1,0	Continuous Tx Channel 6, 24Mbps	
at+wtx100test=11,0,26,0,0,0,0,1,0,0,0,1,1,0	Continuous Tx Channel 11, 24Mbps	
At+reset	Transmitter off	
Transmitted Tx at 18Mbps		
Command	Action	
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,27,0,0,0,0,1,0,0,0,1,6,0	Continuous Tx Channel 1, 18Mbps	
at+wtx100test=6,0,27,0,0,0,0,1,0,0,0,1,6,0	Continuous Tx Channel 6, 18Mbps	
at+wtx100test=11,0,27,0,0,0,0,1,0,0,0,1,6,0	Continuous Tx Channel 11, 18Mbps	
At+reset	Transmitter off	
Transmitted Tx at 12Mbps		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,27,0,0,0,0,1,0,0,0,1,2,0	Continuous Tx Channel 1, 12Mbps	
at+wtx100test=6,0,27,0,0,0,0,1,0,0,0,1,2,0	Continuous Tx Channel 6, 12Mbps	
at+wtx100test=11,0,27,0,0,0,0,1,0,0,0,1,2,0	Continuous Tx Channel 11, 12Mbps	
At+reset	Transmitter off	
Transmitted Tx at 9Mbps		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,27,0,0,0,0,1,0,0,0,1,7,0	Continuous Tx Channel 1, 9Mbps	
at+wtx100test=6,0,27,0,0,0,0,1,0,0,0,1,7,0	Continuous Tx Channel 6, 9Mbps	
at+wtx100test=11,0,27,0,0,0,0,1,0,0,0,1,7,0	Continuous Tx Channel 11, 9Mbps	
At+reset	Transmitter off	
Transmitted Tx at 6Mbps		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,27,0,0,0,0,1,0,0,0,1,3,0	Continuous Tx Channel 1, 6Mbps	
at+wtx100test=6,0,27,0,0,0,0,1,0,0,0,1,3,0	Continuous Tx Channel 6, 6Mbps	
at+wtx100test=11,0,27,0,0,0,0,1,0,0,0,1,3,0	Continuous Tx Channel 11, 6Mbps	
At+reset	Transmitter off	

802.11n, Transmitter command:

Transmitted Tx at MCS7		
Command	Action	
at+wrfteststart	Start up internal Power Amplifier	

at+wtx100test=1,0,18,0,0,0,0,1,0,0,0,1,7,2	Continuous Tx Channel 1, 72Mbps	
at+wtx100test=6,0,18,0,0,0,0,1,0,0,0,1,7,2	Continuous Tx Channel 6, 72Mbps	
at+wtx100test=11,0,18,0,0,0,0,1,0,0,0,1,7,2	Continuous Tx Channel 11, 72Mbps	
At+reset	Transmitter off	
Transmitted Tx at MCS6		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,20,0,0,0,0,1,0,0,0,1,6,2	Continuous Tx Channel 1, 65Mbps	
at+wtx100test=6,0,20,0,0,0,0,1,0,0,0,1,6,2	Continuous Tx Channel 6, 65Mbps	
at+wtx100test=11,0,20,0,0,0,0,1,0,0,0,1,6,2	Continuous Tx Channel 11, 65Mbps	
At+reset	Transmitter off	
Transmitted Tx at MCS5		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,24,0,0,0,0,1,0,0,0,1,5,2	Continuous Tx Channel 1, 57.8Mbps	
at+wtx100test=6,0,24,0,0,0,0,1,0,0,0,1,5,2	Continuous Tx Channel 6, 57.8Mbps	
at+wtx100test=11,0,24,0,0,0,0,1,0,0,0,1,5,2	Continuous Tx Channel 11, 57.8Mbps	
At+reset	Transmitter off	
Transmitted Tx at MCS4		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,25,0,0,0,0,1,0,0,0,1,4,2	Continuous Tx Channel 1, 43.3Mbps	
at+wtx100test=6,0,25,0,0,0,0,1,0,0,0,1,4,2	Continuous Tx Channel 6, 43.3Mbps	
at+wtx100test=11,0,25,0,0,0,0,1,0,0,0,1,4,2	Continuous Tx Channel 11, 43.3Mbps	
At+reset	Transmitter off	
Transmitted Tx at MCS3		
Command	Action	
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,27,0,0,0,0,1,0,0,0,1,3,2	Continuous Tx Channel 1, 28.9Mbps	
at+wtx100test=6,0,27,0,0,0,0,1,0,0,0,1,3,2	Continuous Tx Channel 6, 28.9Mbps	
at+wtx100test=11,0,27,0,0,0,0,1,0,0,0,1,3,2	Continuous Tx Channel 11, 28.9Mbps	
At+reset	Transmitter off	
Transmitted Tx at MCS2		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,27,0,0,0,0,1,0,0,0,1,2,2	Continuous Tx Channel 1, 21.7Mbps	
at+wtx100test=6,0,27,0,0,0,0,1,0,0,0,1,2,2	Continuous Tx Channel 6, 21.7Mbps	
at+wtx100test=11,0,27,0,0,0,0,1,0,0,0,1,2,2	Continuous Tx Channel 11, 21.7Mbps	
At+reset	Transmitter off	

Transmitted Tx at MCS1		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,27,0,0,0,0,1,0,0,0,1,1,2	Continuous Tx Channel 1, 14.4Mbps	
at+wtx100test=6,0,27,0,0,0,0,1,0,0,0,1,1,2	Continuous Tx Channel 6, 14.4Mbps	
at+wtx100test=11,0,27,0,0,0,0,1,0,0,0,1,1,2	Continuous Tx Channel 11, 14.4Mbps	
At+reset	Transmitter off	
Transmitted Tx at MCS0		
at+wrfteststart	Start up internal Power Amplifier	
at+wtx100test=1,0,27,0,0,0,0,1,0,0,0,1,0,2	Continuous Tx Channel 1, 7.2Mbps	
at+wtx100test=6,0,27,0,0,0,0,1,0,0,0,1,0,2	Continuous Tx Channel 6, 7.2Mbps	
at+wtx100test=11,0,27,0,0,0,0,1,0,0,0,1,0,2	Continuous Tx Channel 11, 7.2Mbps	
At+reset	Transmitter off	

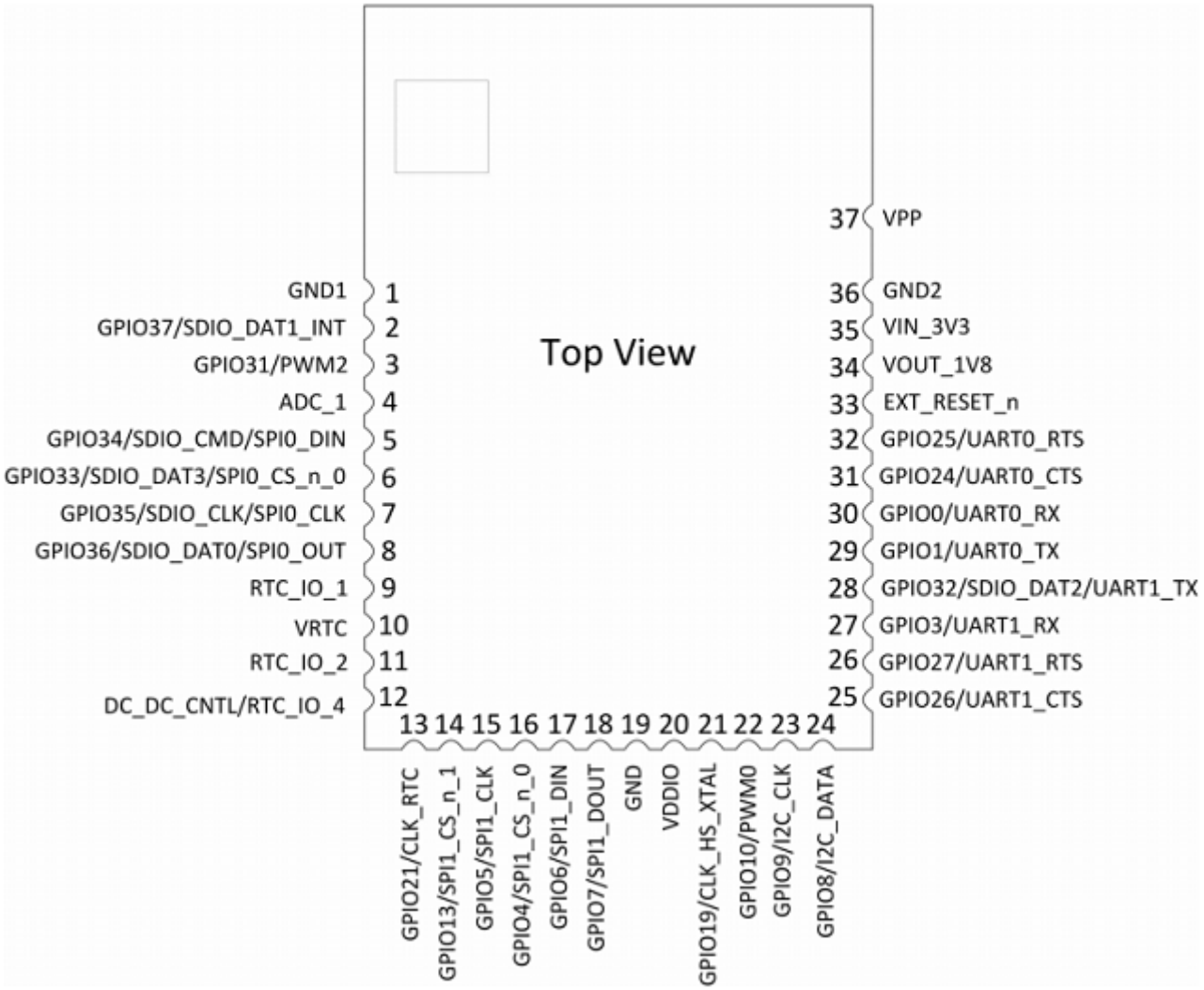
CW Transmitter command:

at+wrfteststart	Start up internal Power Amplifier	
at+wcarwavtest=1,0,20,0,0	CW Tx Channel 1	
at+wcarwavtest=6,0,20,0,0	CW Tx Channel 6	
at+wcarwavtest=11, 0,20,0,0	CW Tx Channel 11	
At+reset	Transmitter off	

Received command

Command	Action	
AT+WRXTEST= 1,0,4294930106,00:11:22:33:44:55,0	Rx on channel 1	
AT+WRXTEST= 6,0,4294930106,00:11:22:33:44:55,0	Rx on channel 6	
AT+WRXTEST= 11,0,4294930106,00:11:22:33:44:55,0	Rx on channel 11	
At+wrxstop	Stop action	

Device Pin-out Diagram (Module top view)



DFWM-GIB0x Device Pin-out Diagram (Module top view)

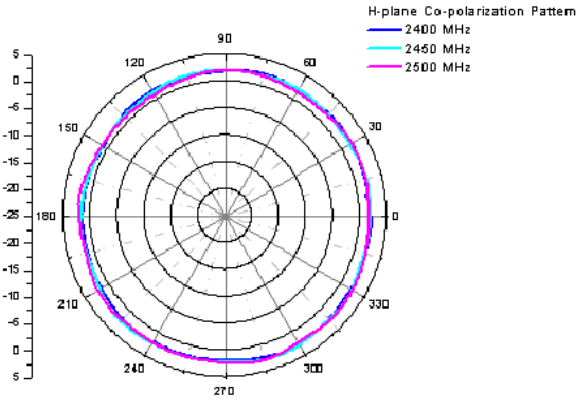
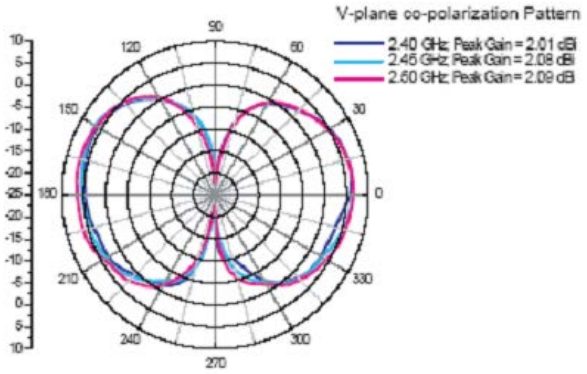
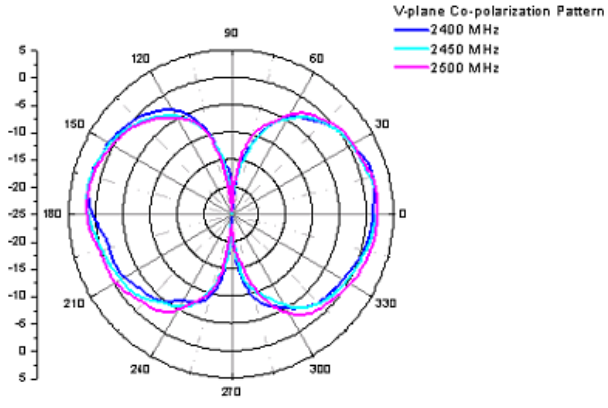
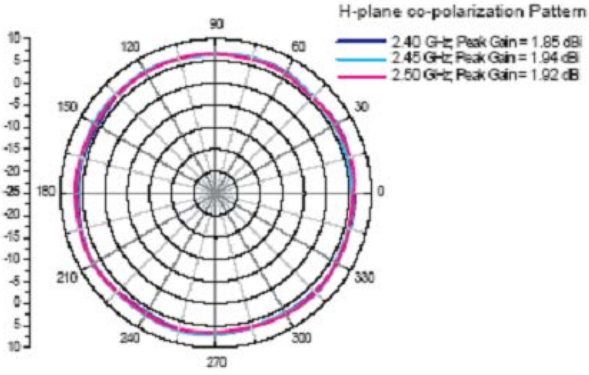
Module Pins Description

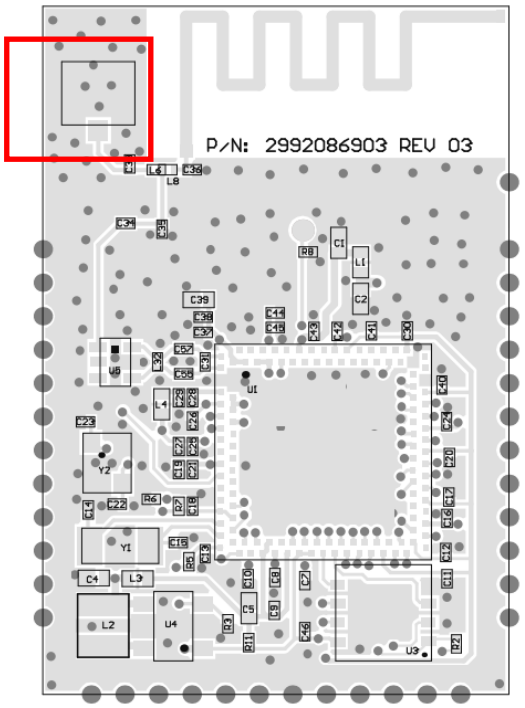
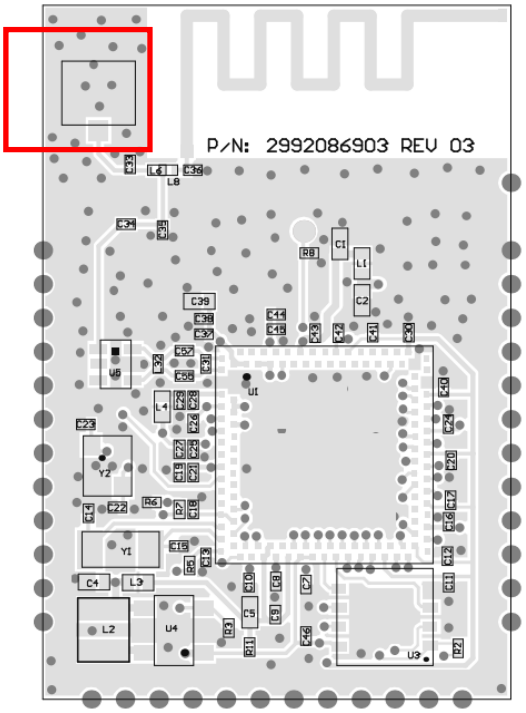
PinNo	Name	Voltage Domain	Internal Bias after hardware reset	Drive Strength (mA)	Signal State	Description
1	GND	0V	Not Applicable		Analog port	Module Ground
2	GPIO37/ SDIO_DAT1_INT	VDDIO	Pull-down (See Note 3)	4	Digital Input/ Output	General Purpose Input Output/4-bit SDIO DATA Bit 1/SDIO SPI Mode Interrupt
3	GPIO31/PWM2	VDDIO	Pull-down	16	Digital Input/ Output	General Purpose Input Output/Pulse Width Modulation Output 2
4	ADC_1	VIN_3V3	Not Applicable		Analog Input	General Analog to Digital Converter
5	GPIO34/SDIO_CMD/SPI0_DIN	VDDIO	Pull-down (See Note 1)	4	Digital Input/ Output	General Purpose Input Output/SDIO Command Input/SPI0 Receive Data Input from the HOST
6	GPIO33/SDIO_DAT3/SPI0_CS_n_0	VDDIO	Pull-up (See Note 1)	4	Digital Input/ Output	General Purpose Input Output/SDIO Data Bit 3/SPI0 Chip Select Input 0 from the HOST(Active Low)
7	GPIO35/SDIO_CLK /SPI0_CLK	VDDIO	Pull-down (See Note 1)	4	Digital Input/ Output	General Purpose Input Output / SDIO Clock/ SPI0 Clock Input from the HOST
8	GPIO36/SDIO_DAT0/SPI0_DOUT	VDDIO	Pull-down (See Note 1)	4	Digital Input/ Output	General Purpose Input Output / SDIO Data Bit 0 / SPI0 Transmit Data Output to the HOST
9	RTC_IO_1	VRTC	Pull-down (See Note 1)	1	RTC Digital Input/Output	Embedded Real Time Clock Input/Output 1
10	VRTC	VRTC	Not Application		Analog port	Embedded Real Time Clock Power Supply
11	RTC_IO_2	VRTC	Pull-down (See Note 1)	1	RTC Digital Input/Output	Embedded Real Time Clock Input/Output 2
12	DC_DC_CNTL/ RTC_IO_4	VRTC	Pull-down (See Note 1)	1	RTC Digital Input/Output	VIN_3V3 Regulator Control Output/RTC Digital Input/Output
13	GPIO21/CLK_RTC	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Internal RTC Clock Circuitry Test Point
14	GPIO13/ SPI1_CS_n_1	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Serial Peripheral Interface 1 Chip Select_1(Active low)
15	GPIO5/SPI1_CLK	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Serial Peripheral Interface 1 Bus Clock
16	GPIO4/ SPI1_CS_n_0	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Serial Peripheral Interface 1 Chip Select_0(Active low)

17	GPIO6/SPI1_DIN	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Serial Peripheral Interface 1 Bus Data Input
18	GPIO7/ SPI1_DOUT	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Serial Peripheral Interface 1 Bus Data Output
19	GND	0V	Not Application	4	Analog port	Module Ground
20	VDDIO	VDDIO	Not Application		Analog port	All I/O voltage domain
21	GPIO19/ CLK_HS_XTAL	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/XTAL Clock Circuitry Test Point
22	GPIO10/PWM0	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Pulse Width Modulator 0
23	GPIO9/I2C_CLK	VDDIO	Pull-down (see Note 4)	12	Digital Input/ Output	General Purpose Input Output/Inter-Integrated Circuit Clock
24	GPIO8/I2C_DATA	VDDIO	Pull-down (see Note 4)	12	Digital Input/ Output	General Purpose Input Output/Inter-Integrated Circuit Data
25	GPIO26/ UART1_CTS	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Universal Async Receiver Transmitter 1 Clear to Send Output (Note 6)
26	GPIO27/ UART1_RTS	VDDIO	Pull-down (see Note 2)	4	Digital Input/ Output	General Purpose Input Output/Universal Async Receiver Transmitter 1 Request to Send Output (Note 6)
27	GPIO3/UART1_RX	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Universal Async Receiver Transmitter 1 Receiver Input
28	GPIO32/SDIO_DAT 2/UART1_TX	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/SDIO_DATA Bit 2/ Universal Asynchronous Receiver Transmitter 1 Transmitter Output
29	GPIO1/UART0_TX	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Universal Async Receiver Transmitter 0 Transmitter Output
30	GPIO0/UART0_RX	VDDIO	Pull-down	4	Digital Input/ Output	General Purpose Input Output/Universal Asynch Receiver Transmitter 0 Receiver Input
31	GPIO24/ UART0_CTS	VDDIO	Pull-down	12	Digital Input/ Output	General Purpose Input Output/Universal Async Receiver Transmitter 0 Request to Send Input (see Note 6)

32	GPIO25/ UART0_RTS	VDDIO	Pull-down	12	Digital Input/ Output	General Purpose Input Output/Universal Async Receiver Transmitter0 Clear to Send Input(see Note 6)
33	EXT_RESET_n(see Note 5)	VDDIO			Digital Open Drain In/Out	Module Hardware Reset Input and Power Supply Reset Monitor Indictor Active Low
34	VOUT_1V8	VIN_3V3	Not Application		Analog Port	Internal 1.8V Vout (internal regulated)
35	VIN_3V3	VIN_3V3	Not Applicable	4	Analog Port	Signal Supply port
36	GND	0V	Not Applicable		Analog port	Module Ground
37	VPP(see Note 8)	VPP			Analog port	Programming Voltage for OTP Memory

Antenna Information

	RFA-02-P33-70B-150	RFA-02-L2H1
Frequency range	**2400 MHz – 2500 MHz**	**2400 MHz – 2500 MHz**
Peak gain	**2 dBi**	**2.5 dBi**
Average gain	**1 dBi**	
VSWR	**2.0 : 1 Max.**	**2.0 : 1 Max.**
Radiated pattern **H-Plane**		
V-Plane		

Location include		

Canada, Industry Canada (IC) Notices

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.

This device complies with Industry Canada licence-exempt RSS standard(s).
Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Radio Frequency (RF) Exposure Information

To comply with RSS 102 RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.

This device has been certified for use in Canada. Status of the listing in the Industry Canada's REL (Radio Equipment List) can be found at the following web address:
http://www.ic.gc.ca/app/sitt/reltel/srch/nwRdSrch.do?lang=eng
Additional Canadian information on RF exposure also can be found at the following web address:
http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html

Canada, avis d'Industry Canada (IC)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Informations concernant l'exposition aux fréquences radio (RF)

Pour se conformer aux exigences de conformité CNR 102 RF exposition, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et toutes les personnes

Ce périphérique est homologué pour l'utilisation au Canada. Pour consulter l'entrée correspondant à l'appareil dans la liste d'équipement radio (REL - Radio Equipment List) d'Industry Canada rendez-vous sur:
http://www.ic.gc.ca/app/sitt/reltel/srch/nwRdSrch.do?lang=eng

Pour des informations supplémentaires concernant l'exposition aux RF au Canada rendez-vous sur : http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html

Federal Communications Commission (FCC) Statement

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

Section 15.105 (a) **for Class A Device**

For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

15.105(b) **for Class B Device (usual)**

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

Part 15.19(a)(3) unlicensed project (WLAN Device)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1) this device may not cause harmful interference, and

2) this device must accept any interference received, including interference that may cause undesired operation of the device.

End Product Labeling:

The final end product must be labeled in a visible area with the following: “Contains FCC ID: YOPGS2011MIES”.

Manual Information That Must be Included:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove. This RF module in the user’s manual of the end product which integrates this module. The user’s manual for OEM Integrators must include the following information in a prominent location

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This radio module should not installed and operating simultaneously with other radio.